

Amendments to Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims

1. - 8. (Canceled)

9. (New) A device for broadband transmission of digital optical signals between at least one first unit and at least one second unit traveling relative to the first unit along a given track, the device comprising, in association with the first unit:

a data source for generating a serial data stream; an optical transmitter for generating optical signals from the serial data stream of the data source;

an optical waveguide for guiding the optical signals generated by the optical transmitter;
and

comprising, in association with the second unit:

a coupling element for tapping optical signals from the optical waveguide;

an optical receiver for receiving the signals tapped by the coupling element;

a data sink for further processing the signals received by the optical receiver;

an evaluation means comprising a micro controller and memory coupled to the receiver for measuring a value corresponding to an operating characteristic of a transmission path between the transmitter and receiver;
and

a controller coupled to the data source for receiving the value from the micro controller, and to modify the data rate or data package size depending on whether the value differs from a desired value.

10. (New) A device for broadband transmission of digital optical signals between at least one first unit and at least one second unit traveling relative to the first unit along a given track, the device comprising, in association with the first unit:

a data source for generating a serial data stream; an optical transmitter for generating optical signals from the serial data stream of the data source;

an optical waveguide for guiding the optical signals generated by the optical transmitter;
and

comprising, in association with the second unit:

a coupling element for tapping optical signals from the optical waveguide; an optical receiver for receiving the signals tapped by the coupling element;

a data sink for further processing the signals received by the optical receiver;

a measuring device coupled to the optical receiver for measuring a value corresponding to an operating characteristic of the optical waveguide, selected from the group consisting of signal-to-noise differences, bit error rate, and relative positions between the first and second units;

a micro controller for receiving the measured value and storing said value in memory if the value differs from a desired value; and

a controller coupled between the data source and the optical transmitter for receiving the stored value and for modifying the data rate or data package size sent from the optical transmitter.

11. (New) The device according to claim 10, wherein the controller is configured for storing data, and also for transmitting stored data at varying data rates to the transmitter.

12. (New) The device according to claim 9 or 10, wherein the desired value is set by a setpoint device according to the actually prevailing transmission characteristics of the data path between the optical transmitter and the optical receiver.

13. (New) The device according to claim 9 or 10, wherein the measuring device is provided between the optical receiver and the data sink, wherein the measuring device has additional means for signaling incorrectly transmitted data via the micro controller to the controller by means of an auxiliary transmission channel, and wherein the controller is adapted to repeat a transmission of incorrectly received data packages upon request by the evaluation means.

14. (New) The device according to claim 9 or 10, wherein the micro controller is provided for control and diagnosis of the device.

15. (New) The device according to claim 9 or 10, wherein the device is self-learning and during operation dynamically adapts to currently prevailing operating conditions.

16. (New) A method for broadband transmission of digital signals between at least one first unit and at least one second unit traveling relative to the first unit along a given track, the method comprising the steps of:

generating from a data source at the first unit a serial data stream;

generating optical signals from the serial data stream of the data source with an optical transmitter at the first unit;

guiding the optical signals generated with the optical transmitter along an optical waveguide;

tapping optical signals from the optical waveguide with a coupling element at the second unit;

receiving the optical signals tapped with the coupling element with an optical receiver at the second unit;

further processing the signals received by the optical receiver at a data sink at the second unit;

performing dynamically during transmission of the digital signals:

measuring the signals received by the optical receiver for determining a value which is representative of transmission characteristics of a data path between the transmitter and the receiver; and

setting a data rate or a size of data packages for transmission along the data path in accordance with a comparison between the measured value and a desired value.